

## NEW DESCRIPTIONS

RECORD OF TWO NEW SPECIES OF *APANTELES* FOERSTER  
(BRACONIDAE: MICROGASTRINAE) FROM CENTRAL INDIAPUJA RAY<sup>1,2</sup> AND MOHD. YOUSUF<sup>1,3</sup><sup>1</sup>Forest Entomology Division, Tropical Forest Research Institute, Jabalpur 482 021, Madhya Pradesh, India.<sup>2</sup>Email: puja.ray@gmail.com<sup>3</sup>Email: yousuf\_tfri@yahoo.com

Two new species *Apanteles neohyblaeae* and *A. lakhaensis* are described and illustrated. Specimens of *A. neohyblaeae* emerged from unidentified lepidopterous larvae on *Tamarindus indica*. Specimens of *A. lakhaensis* emerged from *Margaronia* sp., infesting *Casearia graveolens*. Further their affinities with the closely related species *A. hyblaeae* Wilkinson have also been discussed.

**Key words:** *Apanteles lakhaensis*, *Apanteles neohyblaeae*, Braconidae, Hymenoptera, Microgastrinae

## INTRODUCTION

The microgastrine braconid wasps of genus *Apanteles* Foerster (Hymenoptera: Braconidae) include species which are economically very important since they parasitize various lepidopterous pests. Several *Apanteles* species have been reared from a large number of native lepidoptera and are undoubtedly important in regulating populations of many pest species (Varadarasan 1985; Mohan *et al.* 1992; Geetha Bai and Marimadaiah 2000; Pandey *et al.* 2004). In India, three *Apanteles* species, namely *A. hyblaeae*, *A. malevolus*, *A. subandinus*, have been imported as biocontrol agents of some major lepidopterous pests in agriculture and forestry (Singh 2004). Several workers including Wilkinson (1928), Bhatnagar (1948), Rao (1961), Nixon (1967), Sharma and Chatterjee (1970a, b), Sharma (1972, 1973a, b), Sumodan and Sevichan (1989) Kurhade and Nikam (1997), Sathe and Inamdar (1989), Sathe and Ingawale (1995), and Sumodan and Narendran (1990) have published research papers on the systematics of Indian species of *Apanteles*. In spite of relatively good knowledge of braconid fauna from India, not much work has been carried out from Central India. In the present paper, two new species *Apanteles neohyblaeae* and *A. lakhaensis* are being recorded as larval parasitoids of lepidopterous insect pests, infesting forest tree species. The new species are being illustrated and described in detail.

## MATERIAL AND METHODS

Systematic survey of various forests and agro-forest areas of Chhattisgarh and Maharashtra, India, was conducted for a collection of braconid parasitoids, and their host larvae of insect pests infesting forest tree species. Several larvae that were expected to be the common hosts of braconid

parasitoids were collected from dense canopy of the forests. They were brought to the laboratory and attempts were made to rear the collected larvae on their host plant leaves. From a few larvae, adult braconids emerged. These braconids were collected and identified. Morphological terminology especially that of wing vein nomenclature follows that of modified Comstock-Needham system (Wilkinson 1928; Eady 1968) Figures were drawn with the help of camera lucida, attached to a stereoscopic trinocular microscope and measurements were taken by using an ocular micrometer.

**Abbreviations used:** OOL – Ocello-ocular line (distance from the outer edge of a lateral ocellus to the compound eye); POL – post-ocellar line (distance between the inner edges of the two lateral ocelli); AOL – anterior-ocellar line (distance between the inner edge of anterior and lateral ocellus); ØOD – diameter of an ocellus.

*Apanteles neohyblaeae* sp. nov.

(Fig. 1a-f)

**Female:** Body length 2.51 mm (excluding ovipositor and antenna); forewing length 2.4 mm; antenna length 3 mm.

**Colour:** Ground colour of the body largely reddish black; except legs largely reddish yellow; antenna, apical tip of hind femur, hind tibia at apical one third and hind tarsal segments largely, all coxae and ovipositor sheath reddish brown. The wing veins are light brown. The mandibles, palpi and tibial spur pale. First tergite dark brown while succeeding tergites are tumescent and reddish yellow.

**Head:** Head nearly as long as wide. Face finely punctate: OOL is half of POL. POL equal to ØOD, AOL is 1.2x POL. Malar space 1.7x base of mandible; antennae (Fig. 1a,b) filiform, with 16 flagellar segments and 1.2x longer than body.

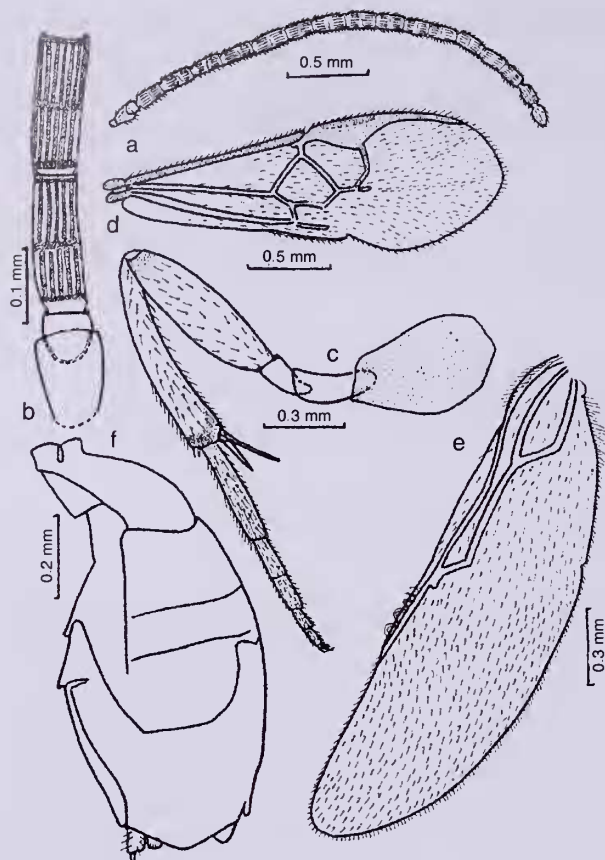


Fig. 1: a-f: *Apanteles neohyblaeae* sp. nov.: a. Antenna ♀, b. Antenna (enlarged) ♀, c. Hind leg ♀, d. Forewing ♀, e. Hind wing ♀, f. Metasoma ♀

**Mesosoma:** Mesonotum 1.1 mm long, rugose with regular punctations; forewings (Fig. 1d), 2.4 mm long, 0.9 mm broad, stigma 0.48 mm long and 0.18 mm wide, metacarp 0.51 mm, the 1<sup>st</sup> abscissa of the radial 0.19 mm, transverse cubital 0.10 mm, the apical portion of first abscissa of cubital 0.10 mm, recurrent vein 0.14 mm, pigmented portion of the 2<sup>nd</sup> abscissa of the cubital 0.09 mm, upper portion of basal vein 0.09 mm; hind wings (Fig. 1e) about 2.0 mm long, and 0.6 mm wide, vannal lobe of the hind wings sub-apically flattened with a few setae; hind legs (Fig. 1c), coxa finely, evenly punctate except outer face which is more or less bare, hind femur 0.63 mm long, 0.18 mm wide; tibia 0.75 mm long, 0.13 mm wide, basal joint of hind tarsus 0.38 mm long, longer tibial spur 0.24 mm long, shorter tibial spur 0.20 mm.

**Metasoma:** Metasoma (Fig. 1f) length 1.05 mm; first metasomal tergite more rugose in its apical half, 0.4 mm long, 0.3 mm apical width, 0.2 mm basal width. The second tergite is tumescent and bright and is bead-like sculptured along the central line. The ovipositor sheath 0.11 mm long, ovipositor 0.12 mm long.

**Male:** Same as female; except antenna (2.75 mm) is shorter than body (2.9 mm), the upper portion of the basal vein (0.05 mm) is shorter than pigmented portion of second abscissa of the cubital (0.06 mm), and the second tergite is not tumescent and bright as in female but is evenly punctate.

**Holotype** ♀ INDIA: Maharashtra, Ahmednagar (Kolhari), 19.ix.2007, emerged from unidentified lepidopterous larvae on *Tamarindus indica*; collected by Mohd. Yousuf; Paratype 3 ♀, 5 ♂, same data as for holotype.

Holotype ♀ and 1 ♂ paratype have been deposited at National Forest Insect Collection, Entomology Division, Forest Research Institute, Dehradun, India (Acc. No. 21895);

Remaining paratypes have been deposited at the Insect Collection Museum, Forest Entomology Division, Tropical Forest Research Institute, Jabalpur, India (Acc. No. 666).

**Etymology:** The new species, *A. neohyblaeae* is named so due to its close affinities with *A. hyblaeae*.

The new species, *A. neohyblaeae* is very close to *A. hyblaeae* Wilkinson, largely in having forewings with first abscissa of radial fairly straight, successively thicker below, well-marked from the transverse cubital, upper portion of basal vein shorter than apical portion of first abscissa of cubital, recurrent longer than transverse cubital, length of stigma shorter than metacarp. First metasomal tergite length 1.5x its apical width and slightly widening towards the apical end.

However, *A. neohyblaeae* differs from the *A. hyblaeae* in having transverse cubital equal to apical portion of first abscissa of cubital in *A. neohyblaeae* while in *A. hyblaeae* it is longer; upper portion of the basal vein equal to the pigmented portion of the second abscissa of the cubital while in *A. hyblaeae* the upper portion of the basal vein is longer than the pigmented portion of the second abscissa of the cubital. Hind legs with longer hind tibial spur three-fifth and shorter tibial spur about half the length of hind basitarsus in *A. neohyblaeae*, while longer hind tibial spur half and shorter tibial spur more than one third the length of hind basitarsus in *A. hyblaeae*. Further the two species differ in the first metasomal tergite in males. In *A. hyblaeae*, the first tergite narrowing towards the apex while in the new proposed species the tergite broadens at its apical end. The ovipositor sheath in the female of *A. hyblaeae* is as long as the basal joint of the hind tarsus while in the new species ovipositor sheath is about one-fourth as long as basal joint of the hind tarsus.

***Apanteles lakhaensis* sp. nov.**

(Fig. 2a-f)

**Female:** Body length 2.8 mm (excluding ovipositor and antenna); forewing length 2.8 mm; antenna length 2.1 mm.

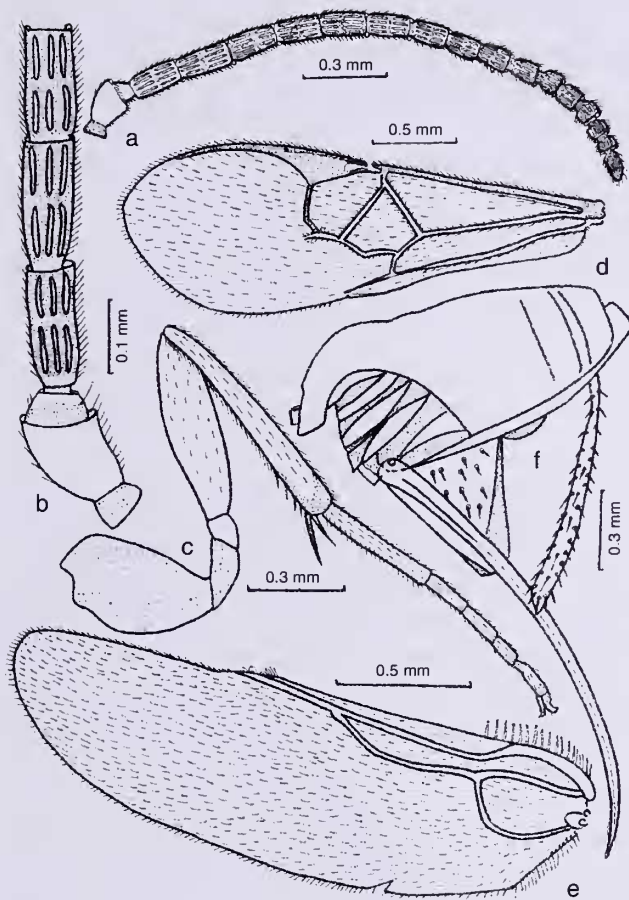


Fig 2: a-f: *Apanteles lakhaensis* sp. nov.: a. Antenna ♀, b. Antenna (enlarged) ♀, c. Hind leg ♀, d. Forewing ♀, e. Hind wing ♀, f. Metasoma ♀.

**Colour:** Ground colour of the body black; except head reddish black; legs brownish yellow; mandibles, antennae, coxa, apex of hind tibia and hind tarsi, stigma, metacarp, 1<sup>st</sup> abscissa of radial, transverse cubital, pigmented portion of the first abscissa of cubital light brown. Ovipositor sheath and stigma at the margins are brown; costal vein basally pale or apically light brown. Rest of the area of the forewing and hind wing hyaline; tibial spur pale.

**Head:** Face finely punctate, occiput with coarse indefinite punctation; OOL 3.3x POL, POL 0.75x shorter than AOL; OOL 2x ØOD; malar space 2.5x base of mandibles; antennae (2.1 mm) filiform (Fig. 2a,b), with 16 flagellar segments and is shorter than the body (2.8 mm).

**Mesosoma:** Mesonotum anteriorly with sparse and strong punctation and posteriorly having punctures, more widely separated and stronger; interspaces entirely smooth and highly polished and shiny; disc of the scutellum entirely smooth, highly polished and shining; propodeum basally largely rugose, apically virtually unsculptured, the areola not entirely devoid of indefinite punctures; carina of areola and costae strong. Fore wings (Fig. 2d) 2.8 mm long, 1.0 mm

broad, stigma 0.58 mm long and 0.19 mm wide; metacarp 0.64 mm; the 1<sup>st</sup> abscissa of the radial 0.22 mm, successively thicker below, fairly well-marked from transverse cubital, transverse cubital 0.13 mm, the apical portion of the first abscissa of cubital 0.14 mm, recurrent vein 0.19 mm, pigmented portion of second abscissa of cubital 0.10 mm, upper portion of the basal vein 0.10 mm; hind wings (Fig. 2e) 2.20 mm long, 0.60 mm wide, vannal lobes of hind wings are sub-apically flattened with a few setae; hind legs (Fig. 2c) coxa is sparsely and evenly punctate, hind femur 0.61 mm long and 0.17 mm broad; hind tibia 0.78 mm long and 0.12 mm broad, hind basal tarsus 0.38 mm long, longer tibial spur 0.17 mm long, shorter tibial spur 0.11 mm long.

**Metasoma:** Metasoma (Fig. 2f) 1.20 mm long; first metasomal tergite 0.46 mm long, 0.30 mm apical width, 0.23 basal width; ovipositor sheath 0.80 mm long, uniformly hairy; ovipositor 1.2 mm long.

**Male:** Similar to female.

**Holotype** ♀ INDIA: Chhattisgarh, Raigarh (Lakha), 27.xii.2007, emerged from *Margaronia* sp, infesting *Casearia graveolens*, collected by Mohd. Yousuf; Paratype 2 ♀, 2 ♂, data same as holotype.

Holotype ♀ and 1♂ paratype have been deposited at the National Forest Insect Collection, Entomology Division, Forest Research Institute, Dehradun, India (Acc. No. 21896). Remaining paratypes have been deposited at the Insect Collection Museum, Forest Entomology Division, Tropical Forest Research Institute, Jabalpur, India (Acc. No. 665).

**Etymology:** The new species is named after the place of its collection, Lakha in Raigarh district, Chhattisgarh.

The new species, *A. lakhaensis* is also very close to *A. hyblaeae* Wilkinson largely in body characters. In the forewings first abscissa of radial is just longer than breadth of the stigma, fairly straight, successively thicker below, well-marked from the transverse cubital which is nearly equal to or just longer than the apical portion of the first abscissa of the cubital, as in *A. hyblaeae*.

However, it differs from the latter in having forewings with the length of the upper portion of the basal vein equal to the pigmented portion of the second abscissa of the cubital while in *A. hyblaeae* the upper portion of the basal vein is longer than the pigmented portion of the second abscissa of the cubital. Ovipositor sheath is two times longer than the basal joint of the hind tarsus in *A. lakhaensis* while in *A. hyblaeae*, the ovipositor sheath is equal to the length of the basal joint of the hind tarsus.

The two new species are also largely close to each other. Yet they differ from each other in having antenna longer than body in *A. neo-hyblaeae*, while in *A. lakhaensis* length of the antenna is shorter than body length. In *A. neo-hyblaeae* breadth

of stigma is more than the length of the recurrent while in *A. lakhaensis* width of stigma is equal to recurrent. The metasoma is shorter than mesosoma in *A. neohyblaeae* but longer in *A. lakhaensis*. The ovipositor and ovipositor sheath are very short in *A. neohyblaeae*, but very long in *A. lakhaensis*.

*Apanteles hyblaeae* Wilkinson, *Apanteles neohyblaeae* sp. nov. and *Apanteles lakhaensis* sp. nov. are closely related species; but these three species can easily be distinguished by the following key characters:

1. Fore wings with transverse cubital vein equal or shorter to apical portion of first abscissa of cubital vein; upper portion of basal vein is equal to pigmented portion of the second abscissa of the cubital vein; hind legs with longer tibial spur not half of basitarsus; length of ovipositor sheath not as above ..... 2
- Fore wings with transverse cubital vein longer than apical portion of first abscissa of cubital vein; upper portion of basal vein is longer than the pigmented portion of the second abscissa of the cubital vein; hind legs with longer tibial spur half of basitarsus; ovipositor sheath about as long as hind

basitarsus ..... *Apanteles hyblaeae* Wilkinson

2. Antennae longer than body; fore wings with transverse cubital vein equal to the apical portion of first abscissa of cubital vein; breadth of stigma more than the recurrent vein; ovipositor sheath about one-fourth as long as hind basitarsus ..... *Apanteles neohyblaeae* sp. nov.
- Antennae shorter than body; fore wings with transverse cubital vein shorter to the apical portion of first abscissa of cubital vein; breadth of stigma equal to the recurrent vein; ovipositor sheath two times as long as long as hind basitarsus ..... *Apanteles lakhaensis* sp. nov.

## ACKNOWLEDGEMENTS

We are extremely thankful to Dr. A.K. Mandal, Director, TFRI, Jabalpur, and Dr. K.C. Joshi, Group Coordinator Research and Head, Forest Entomology Division, TFRI, Jabalpur, for providing necessary facilities and encouragement. Financial support from the Council of Scientific and Industrial Research, New Delhi (CSIR Project No. 37(1296) / 07/ EMR II) is also acknowledged.

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